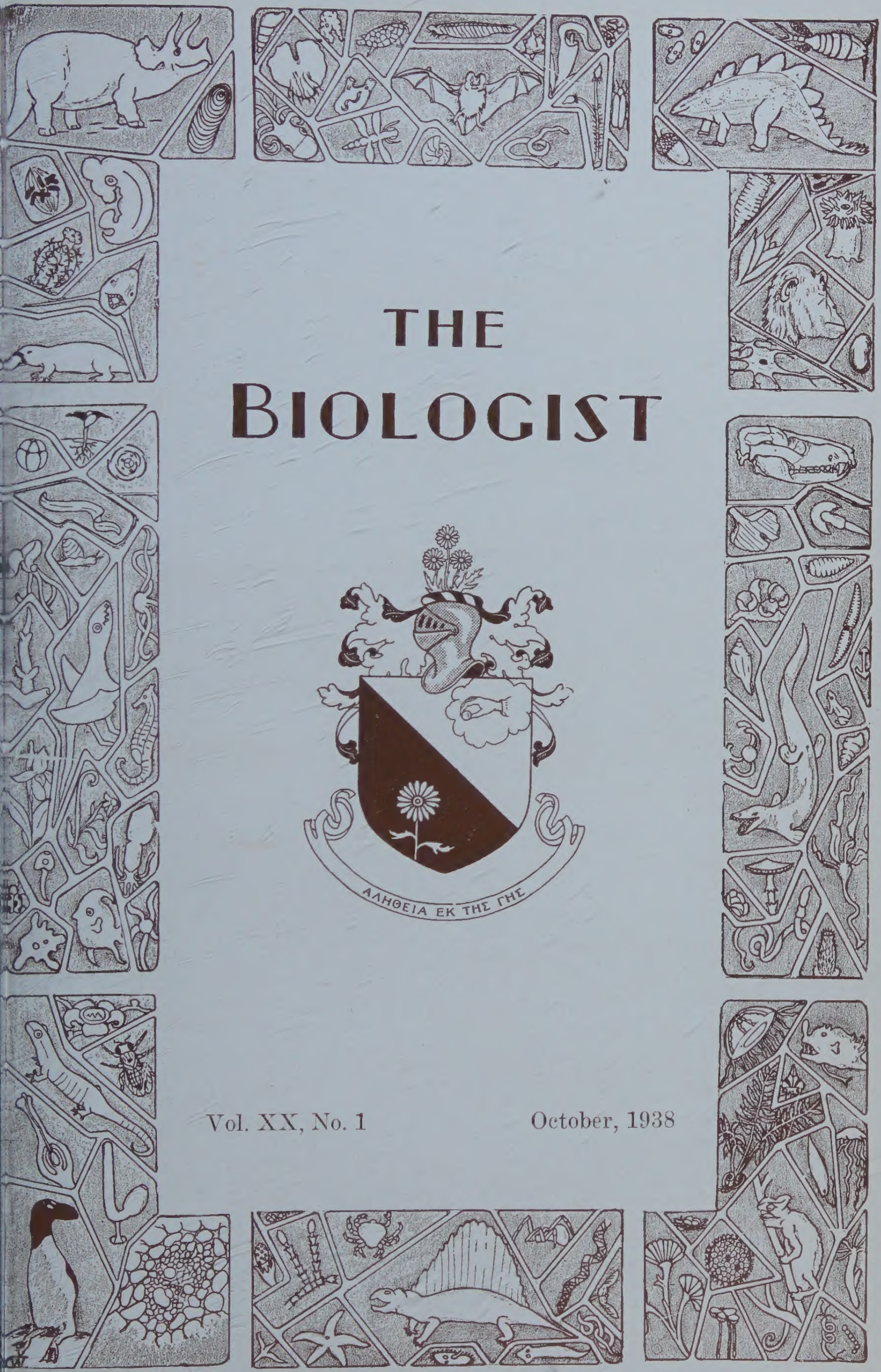
FEATURING NEW MEXICO



THE BIOLOGIST

ΑΛΗΘΕΙΑ ΕΚ ΤΗΣ ΓΗΣ

Vol. XX, No. 1 October, 1938

ABRAHAM: LIFE AND BIOLOGY

THE BIOLOGIST

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CONTENTS

SPECIAL FEATURES

Biology at New Mexico 9

Life and Biology 28
Dr. Ambrosius Abraham

REGULAR FEATURES

Editorials 33

Chapter Reports 36

Book Review 47

Advertising 48-50-52

Outside cover

DIRECTORY

OF ALL ACTIVE AND INACTIVE CHAPTERS

The list of chapter officers will be found in the CHAPTER NEWS section

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ALPHA

Ohio State University, Columbus, Ohio, founded March 17, 1915, (Inactive).

BETA

University of Michigan, Ann Arbor, Michigan. founded June 3, 1916

DELTA

University of Maine, Orono, Maine, founded January 27, 1917.

EPSILON

University of Denver, Denver, Colorado, founded March 5, 1917.

ZETA

University of Wisconsin, Madison, Wisconsin, founded May 30, 1917.

ETA

University of Akron, Akron, Ohio, founded April 20, 1921.

THETA

Michigan State College, East Lansing, Michigan, founded April 9, 1921.

IOTA

Washington University, St. Louis, Missouri, founded May 28, 1921.

KAPPA

University of Kansas, Lawrence. Kansas. founded May 31, 1921.

LAMBDA

University of Montana, Missoula. Montana. founded May 4, 1921.

MU

University of California, Berkeley, California. founded April 27, 1922.

NU

Washington and Jefferson College, Washington, Pennsylvania, founded May 11, 1922

XI

University of Nebraska, Lincoln, Nebraska, founded May 3, 1934.

OMICRON

University of North Dakota, Grand Forks, North Dakota,
founded May 26, 1924, (Inactive).

PI

Emory University, Georgia, founded January 3, 1925.

RHO

University of Illinois, Urbana, Illinois, founded March 28, 1925.

SIGMA

University of Florida, Gainesville, Florida, founded December 4, 1925.

TAU

Duke University, Durham, North Carolina, founded March 4, 1926.

UPSILON

Miami University, Oxford, Ohio, founded May 7, 1926.

PHI

University of New Hampshire, Durham, New Hampshire, founded May 21, 1926.

CHI

Montana State College, Bozeman, Montana, founded February 11, 1927.

PSI

University of Washington, Seattle, Washington, founded April 7, 1928.

OMEGA

University of Oklahoma, Norman, Oklahoma, founded March 24, 1928.

ALPHA ALPHA

University of Southern California, Los Angeles, California, founded May 17, 1930.

ALPHA BETA

Mount Union College, Alliance, Ohio, founded May 17, 1928.

ALPHA GAMMA

University of South Dakota, Vermillion, South Dakota, founded May 15, 1928, (Inactive).

ALPHA DELTA

Lawrence College, Appleton, Wisconsin, founded March 7, 1929.

ALPHA EPSILON

University of Pittsburgh, Pittsburgh, Pennsylvania, founded March 23, 1929.

ALPHA ZETA

College of William and Mary, Williamsburg, Virginia, founded April 19, 1930.

ALPHA ETA

Oklahoma Agricultural and Mechanical College, Stillwater, Oklahoma, founded March 13, 1930.

ALPHA THETA

State College of Washington, Pullman, Washington, founded May, 1930.

ALPHA IOTA

Bucknell University, Lewisburg, Pennsylvania, founded January 9, 1932.

ALPHA KAPPA

Hunter College, New York City, founded January 8, 1932.

ALPHA LAMBDA

University of Utah, Salt Lake City, Utah, founded February 13, 1932.

ALPHA MU

University and State Agricultural College of Oregon, Eugene-Corvallis, Oregon, founded November 18, 1933.

ALPHA NU

University of New Mexico, Albuquerque, New Mexico, founded April 21, 1935

ALPHA XI

Rhode Island State College, Kingston, Rhode Island, founded May 17, 1935.

ALPHA OMICRON

Marquette University, Milwaukee, Wisconsin, founded June 18, 1938

PHI SIGMA
BIOLOGICAL HONOR SOCIETY

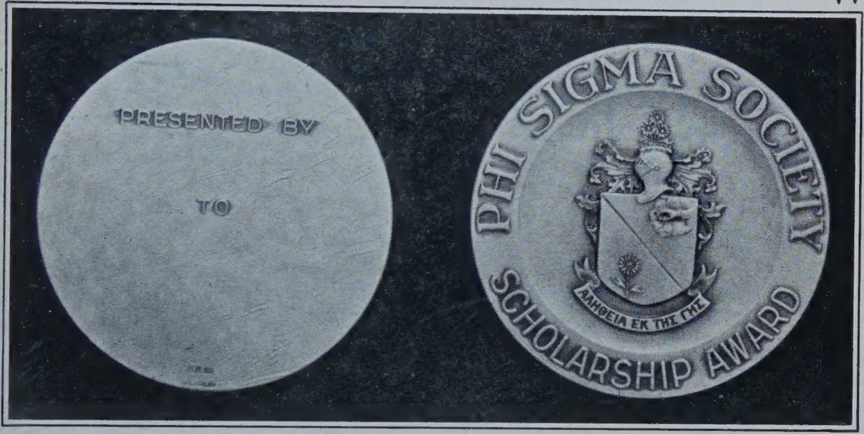
"The object of Phi Sigma is to promote interest in biological research. Although originally designated as an honorary biological research society, it should now be considered as a working guild of biologists interested in research. In effect, election to Phi Sigma should be an opportunity for better work, rather than merely election to an honorary society."

Mile Posts:

1915	March 17, Alpha Chapter organized, Ohio State University.
1916	May, Central Governing Body organized, BIOLOGIST first issued.
1917	June, last War-time BIOLOGIST issued.
1921	February, BIOLOGIST revived.
1924	December, First National Convention, Constitution revised, Washington, D. C.
1925	December, Second National Convention, First Scientific Program, Kansas City.
1926	December, Third National Convention, Second Science Program, Philadelphia.
1927	December, Third Science Program, Nashville.
1928	December, Fourth National Convention, Coat-of-Arms adopted, Fourth Science Program, New York.
1930	January, Council Meeting, Ritual Revised, Norman, Okla. December, Fifth National Convention, Fifth Science Program, Cleveland.
1931	Phi Sigma Letters Registered, U. S. Patent Office.
1932	December, Sixth Science Program, Atlantic City.
1933	June, Sixth National Convention, Seventh Science Program, Chicago.
1935	December, Seventh National Convention, Eighth Science Program, St. Louis.
1937	December, Eighth National Convention, Ninth Science Program, Indianapolis.

Expansion:

The Constitution provides that: "An active chapter may be established in any institution of learning which requires for graduation the equivalent of four years of collegiate work, and which is equipped with facilities for research work. - - - - Any petitioning group must be active for at least one year before it may be granted a charter."



The new Phi Sigma medal for excellence in Biology is here presented in an almost full-size illustration. The medal is of silver in oxidized finish. Authorized by the Eighth National Convention at Indianapolis last year, the medal is to be presented to the best student in biology,—as determined by the biological Faculty of the institution,—by the local chapter of Phi Sigma.

Sandia Mountains east of Campus.

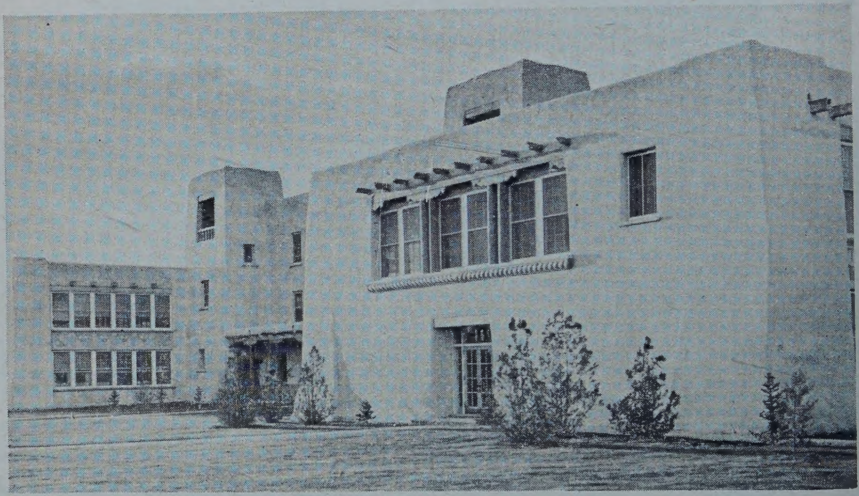
BIOLOGY AT NEW MEXICO —PAST AND PRESENT

ON February 28, 1889 the Legislature of the Territory of New Mexico passed a bill establishing an institution of learning to be known as the "University of New Mexico", to be located in the city of Albuquerque.

Administration Building and Library from roof of a fraternity house (Pi Kappa Alpha).

A clause in the bill stated that the institution "is intended to be the State University when New Mexico shall be admitted as a state into the Union." Although the land for the school was donated to the Territory privately, Congress previously had set aside a grant of 46,080 acres for the institution but this was not to be available until the time of statehood.

The first president of the University was Elias S. Stover, whose term of office began Feb. 9, 1891. A normal department was initiated in June, 1892, and in September of the same year was opened the preparatory department which actually represented the first high school in the Territory of New Mexico. The school opened with two teachers and forty students. By March, 1894, a chair of Chemistry and Physics was established, although the incumbent, W. A. Zimmer, was also required to teach botany and geology, and in addition had charge of the School of Pharmacy, which was opened in 1894. This school was made possible by the voluntary teaching services of several medical men of the city of Albuquerque. Zimmer was later replaced by D. J. Matthews, and in September 1896 R. W. Tinsley was appointed to the chair of Natural Sciences.



Administration Building.

The second president of the institution was a biologist, Clarence Luther Herrick, who had done considerable work on the fresh water Crustacea of Minnesota and had been Instructor of Botany at the University of Minnesota. Dr. Herrick was appointed to begin his services as President on Sept. 1, 1897, which year also initiated the era of high priced athletic coaching at the University, when an athletic instructor was appointed at a salary of $25.00 a month for five months. In the Spring of 1898 Professor Hodgin was paid fifteen dollars a month in addition to his contracted salary to teach Physiology, and in September of the same year Mr. Weinzril was appointed to teach such subjects as might be assigned to him, and became professor of Biology.

During Herrick's administration, which was terminated by death in 1904, the University changed from a literary academy to a scientific school with a graduate department, and as early as 1899 advanced degrees were granted to two candidates, F. S. Maltby who was athletic director at the time, and C. E. Coghill who was instructor in mathematics. In 1897 a laboratory for carrying on bacteriological studies was established upon a self-sustaining basis by fees for work performed for local physicians. By 1899 a man was employed to examine sputum and make haematological studies for the medical profession, and in 1900 Mabel Fitch was appointed instructor in Botany and Zoology.

Dr. Herrick was intensely interested in research, and soon initiated graduate work in Biology and Geology. The subjects of biological instruction listed in the 1898 catalogue of the University were Normal and Pathological Histology, Outline of Cellular Biology, Vertebrate Embryology, Practical Bacteriology, Neurology and Technique, Physical Development, and a Biological Seminar. Herrick's own scientific work in the state dealt largely with the physiology of the nervous system, although one of his papers dealt with the lizards of New Mexico, this being based on collections made by Herrick over a period of several years in addition to those made "by the voluntary geological and natural history survey of the University of New Mexico during the season of 1898." The results of the research directed by Herrick were published in the Journal of Comparative Neurology, Bulletin of the Scientific Laboratories of Denison University, Psychological Review, Anatomischer

Hokona Hall—Girl's Dormitory. Lighted with Luminarios at Homecoming.

Anzeiger, and bulletins of the University of New Mexico, Biological Series.

The Board of Regents of the University soon began to recognize the therapeutic value of southwestern climate and encouraged health-

seekers to attend the University, and special facilities were provided for such students. This policy was soon reflected in the research program of the University, for a number of the early biological publications treated such subjects as the bacterial flora of the semi-desert region of New Mexico, effect of altitude upon the blood, action of sunlight upon bacteria, etc. This work was carried on largely by Weinzril.

Library.

Dr. Wm. G. Tight succeeded Herrick as President, and one of his efforts to advertise the University consisted in sending bacteriological and geological exhibits to the Territorial Fairs. Professor Weinzril resigned in 1907 and J. W. Watson was appointed Professor of Biology, his interests being exemplified by his publication on the flowering plants of Bernalillo County. This change in the trend of investigation in the field of Biology continued with the work of R. O. Weese, who was appointed Associate Professor of Biology in May, 1911, and in 1919 published a paper entitled "A correlation of the environmental reactions of various animals of the arid steppe".

In the Fall of 1919, Miss Edna Mosher was appointed acting Professor of Biology, and in turn Elsie M. Foster was appointed Instructor

Fiesta and Indian Dance at Jemez Indian Pueblo.

in Biology in 1922, to be replaced in 1923 by Dr. Helen E. Murphy of Cornell University. Miss Murphy, who had a deep interest in the anatomy and physiology of the vertebrates continued in her position until 1929.

In 1920 the State Public Health Laboratory was opened, and was located on the University campus under the direction of Miss Myrtle Greenfield, who still continues in this capacity. The Laboratory was supported jointly by the University and the State Health Department until 1921, when the State Department took over the support entirely. In 1937 a fine modern building was erected on the campus to house this Laboratory.

A further change in the trend of outlook of the Biology department was initiated in 1928, when Dr. E. F. Castetter came to the University as head of the department. Beginning in this year the department experienced a rapid growth correlated with the rapid growth of the University in general under the able presidency of Dr. J. F. Zimmerman. When the University opened in 1891 the enrollment was forty, and this quickly grew to 75. At the time of President Tight's resignation in 1909, the student body numbered 163 and by 1926 totaled 353, while at present the enrollment is more than 1600.

Until 1928 the department of Biology had always been staffed by a single instructor, while today there are four full time members on the staff, and three graduate assistants. During this interval the department enrollment has increased from 85 to 500.

Research At New Mexico

ALTHOUGH the Graduate School of the University of New Mexico was not organized until 1919, a number of Masters degrees were conferred previously to that time. Within recent years the number of Graduate students enrolled annually has averaged one hundred forty. In the Spring of 1938 the University decided to offer the Ph.D. in certain limited fields. However, the staff of the Biology department is of the opinion that it is not yet prepared to offer this degree. It is considered necessary to further build certain phases of the undergraduate and Masters degree program before launching additional graduate work. Hence, for the present it is considered advisable to offer exceptionally strong work for the Master's degree, and defer the Ph. D. program until it is possible to offer it upon a plane fully comparable with the degree in the stronger institutions of the country.

Realizing that, because of its size and limited facilities, the Biology Department of the University of New Mexico is unable to carry on a program of instruction and research in the traditional categories to a degree comparable with that in larger institutions, it has decided to pursue a regional program. This is especially opportune in that New Mexico is the scene of the blending of three very divergent races of people. In other words it is considered advisable to adjust instruction and research so as to take advantage of the many opportunities afforded by its natural setting in the Southwest. Moreover, this is in line with the present trend in many parts of the United States. To this end the faculty of the Biology department has decided to stress graduate instruction and research in the following fields: (1) Ethnobiology, or a study of the aboriginal utilization of plant and animal life in the New World for food, clothing, medicine, dyes, etc.—the basic primitive uses of flora and fauna. Associated with this is an investigation of the origin and development of cultivated plants and domesticated animals. The above is being done with special, although not entire emphasis on the Southwest, as evidenced by the present research on primtiive Indian crops, (2) plant

Chetro Ketl Ruins.

and animal ecology and geography. The establishment of the Middle Rio Grande Conservancy District with its system of irrigation and drainage ditches and major diversion of waters is effecting marked changes in flora and fauna in the Rio Grande Valley, and one of the objectives of this phase of the program is an investigation of these changes, with all that they involve. (3) field vertebrate Zoology. The last two are obviously somewhat related, and it is believed that the Southwest offers unexcelled opportunities for an investigation of flora and fauna from a heretofore inadequately worked ecologic and systematic standpoint. New Mexico alone with its wide spread of altitude ranging from 3000 to 13,600 feet with the accompanying diversity of climate, flora, and fauna presents a biologists paradise from this point of view. Dr. Castetter's special interest is in the ethnobiological field, Dr. Bell's emphasis is on plant and animal ecology and geography, while Dr. Koster has recently been brought to the staff from Cornell University to handle the Field vertebrate

Entrance to Biology Building.

Zoology phase. Mr. Grove's field of instruction is Plant Anatomy, Morphology, and Ecology. Also, Mr. Garth Blakely is at present working on his Doctor's degree at the University of California in Vertebrate Zoology, and will later return as a member of the staff. Dr. F. W. Allen, a member of the staff from 1929 to 1938 carried on a series of investigations on blood groups among the Indians of the Southwest.

While the above outlines the policy and program of the department, it is by no means intended to neglect instruction in the regular biological fields. Basic courses in all the major fields of the subject will continue to be offered.

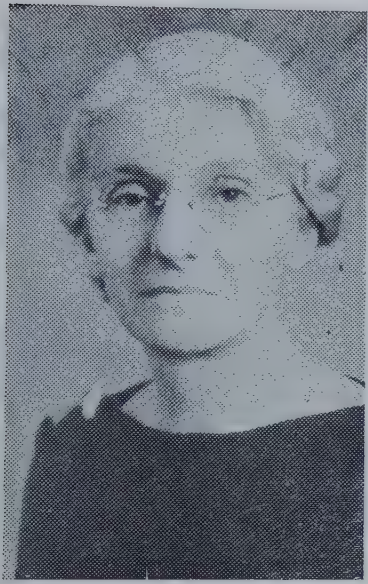
The Biology building was completed in the summer of 1928, but the rapid growth of the department has necessitated expansion into the adjacent Science Building. The herbarium, while not at all comparable in size with those of larger insitutions, contains a representative collection of New Mexican flora, built up within the last ten years. The Biology Library is being built up largely in accordance with the program of graduate instruction and research outlined above.

At present three graduate fellowships, each carrying a stipend of four hundred dollars, are offered by the Department of Biology. At times the number of such fellowships is increased by subsidies by state groups, such as the State Department of Game and Fish. The Biology Department has also been assisted financially at various times in its program of ethnobiological research by grants from the National Research Council, American Academy of Arts and Sciences, and American Philosophical Society. The average number of Masters degrees granted annually by the department within the last few years has been five.

Public Health Laboratory

THE State Public Health Laboratory was opened January, 1920, as one division of the State Department of Health. M. Greenfield was made Director and at that time had no assistants. The University of New Mexico furnished quarters for the laboratory until the State Department of Health, with the co-operation of the University, and U. S. Public Works Administration, constructed a building on the University campus for the use of the laboratory. The building was finished and ready for occupancy October, 1937.

Although the University had given all available space for the laboratory the additional space was sorely needed. In the eighteen years



Miss Myrtle Greenfield.

the personnel had increased from one to fifteen and the number of specimens handled from 0 to 113,464 per year. The building is constructed in the modified pueblo style to conform with the other buildings on the campus, and for its size is one of the best equipped of the state laboratories.

The State Public Health Laboratory handles all work commonly performed in state laboratories. All specimens are received from physicians and health officers of the state and are reported only to physicians or health officers. Throat, stool, sputa, and blood specimens are submitted as aids in diagnosis or for release of quarantine, the number of each depending upon the disease prevalent. At the present time the number of blood specimens submitted for the Wasserman test for Syphilis predominate. This is due to the nation wide campaign for the control of venereal diseases. About 2,500 such blood specimens are handled each month.

State Health Laboratory on University Campus.

New Mexico Biologists

Dr. W. H. Bell.

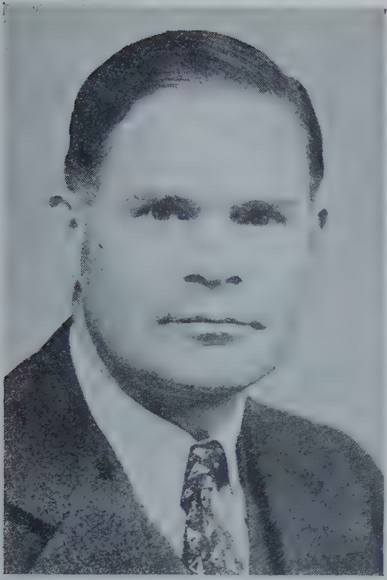
Dr. Willis H. Bell received his degree of Doctor of Philosophy from the University of Chicago. He has been a member of the department at this University for seven years and holds the rank of Associate Professor. He teaches courses in the fields of Ecology, Plant and Animal Geography, and General Botany. He loves nothing better than to develop in his freshmen students a knowledge and love of botany and an appreciation of its practical applications.

Dr. Bell is the undisputed horseshoe pitching champions of the department (?).

H. Garth Blakely, one of New Mexico's native sons, is an instructor in Field Vertebrate Zoology, Embryology, and Comparative Vertebrate Anatomy. In the short while he has been associated with the department as a teacher he has won the respect of his students and colleagues by his vigorous efforts to increase his sphere of knowledge and his sincerity of purpose.

Mr. Blakely is at present doing advanced study in Vertebrate Zoology at the University of California in Berkeley.

Mr. H. G. Blakely.



Dr. E. F. Castetter.

Dr. E. F. Castetter is the head of the Biology Department. In his ten years of service in that capacity he has raised it from a "two-man department" to its present status.

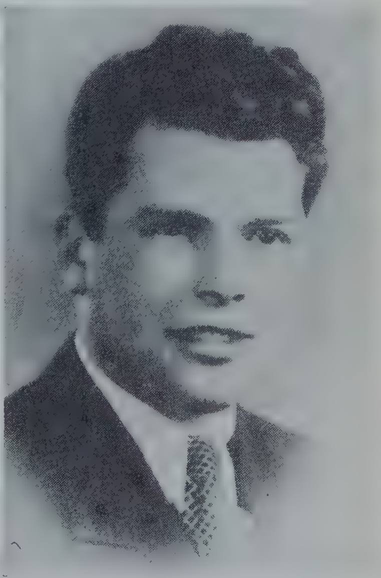
He is especially interested in the Ethnobotany of the Southwestern Indians and in primitive Indian crops. He has pursued vigorous research in this particular field. Prominent among his published papers are several relating to his hobby of aboriginal utilization of plants.

Dr. Castetter teaches courses in Genetics, Evolution, Ethnobiology, and Cultivated plants as well as capably handling the administrative duties of his department. His students respect him for his scholarly teaching and his ready wit.

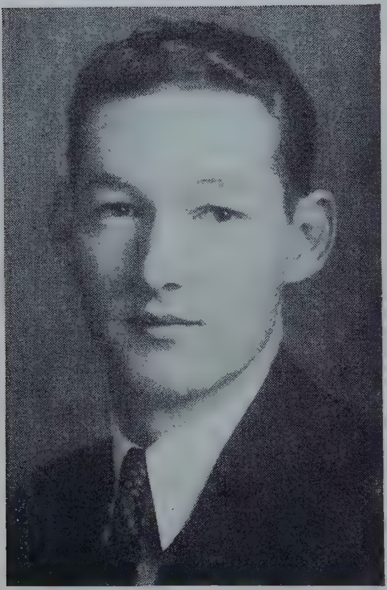
He believes his work to be of the utmost importance but hates to miss a football game.

Alvin R. Grove is an instructor in the Biology Department and came to us from the University of Chicago. He teaches courses in Plant Physiology, Plant Anatomy, and Bacteriology. His particular field of interest is most highly concentrated on the morphological anatomy of plants. He is at present engaged in research concerning the complete anatomy of the agave species of New Mexico.

When he gets away from study and research his favorite pastime is knocking over jack rabbits with his small bore rifle.



Mr. A. R. Grove.



Dr. W. J. Koster.

Dr. William J. Koster came to the University of New Mexico from Cornell University where he received his degree of Doctor of Philosophy in 1936. He holds the rank of Assistant Professor in the department and teaches courses in Economic Vertebrate Zoology, Parasitology, and General Zoology.

His especial interest is primarily in the various aspects of fresh-water ichthyology with a general interest in all vertebrates. In the short time he has been here he has won the admiration of his colleagues with his zeal in collecting and intense interest in his field work. His absolute indifference to snake bites is the marvel of his students.

Early History Of New Mexico

THE earliest biological work done in New Mexico was in 1820 in connection with the famous expedition from Pittsburg to the Rocky Mountains under the command of Major Stephen Harriman Long. This group divided forces eighteen miles above the mouth of the present Las Animas River in Colorado July 24, 1820. The smaller party, comprising ten men, including Major Long, engineer, William James, botanist and geologist, and Titian R. Peale, proceeded southward into northern and eastern New Mexico about the middle of August. The first biological collections of importance, however, were those of William Gambel who collected plants and birds in the vicinity of Santa Fe in July and August 1841 on his way to California. Incidentally, the first extensive collection of plants in the whole southwestern region was at Santa Fe. Gambel made this trip into western United States at the suggestion of Thomas Nuttall, and his plant collections were later described by Nuttall himself. For Gambel are named Gambel oak and Gambel quail.

The years 1845-47 represent an important milestone in the history of New Mexican biology. In the fall of 1845 Lieut. James W. Abert made a trip of biological exploration through northeastern New Mexico and published an account of his trip. The following year he accompanied Lieut. W. H. Emory as far as Bent's Fort on the Arkansas, where he remained because of illness, but finally started Sept. 9 for Santa Fe whence he journeyed to various points in the state until Jan. 15, 1847.

Abo Mission Ruin.

The main account of his trip is to be found in Emory's report, but two short accounts of the birds encountered appear in the journals. The Abert squirrel is named for him.

In the summer of 1846 a company of soldiers, under the command of Col. Stephen Watts Kearney, was sent against the Spanish settlements in New Mexico and California. The expedition was accompanied by Lieut. W. H. Emory, who made observation in natural history along the route. He visited various points in New Mexico, and although no formal report was made on his biological observations, various notes on the plant and animal life are scattered through the general report published in 1848. Similarly, Emory's report of the United States—Mexican Boundary Survey, published in 1857, contains detailed information on various aspects of the survey including the Zoology and Botany of the boundary. The amphibians, birds, reptiles, and mammals of the boundary were presented by S. F. Baird, the fishes by Charles Girard, the botany by John Torrey, the Cactaceae by George Englemann, and the paleontology by T. A. Conrad. Unfortunately the survey barely touched the southern part of New Mexico. In this same connection Dr. Adolphus Wislizenius made a tour of the Southwest, including New Mexico, for scientific purposes in the summer of 1846, being especially interested in the collection of plants, several of which bear his name as their specific designation.

Acoma Indian Pueblo "The Sky City".

Santa Fe, New Mexico, is an historic spot for early plant and bird collections, but it was not until 1847 that this region was at all adequately worked. In the spring of this year August Fendler collected extensive plant material in the vicinity of Santa Fe, and from this Asa Gray described in this *Plantae Fendlerianae* some of our commonest southwestern species, many of which bear the specific name *Fendleri* or *Fendleriana*, and one the generic name *Fendlera.*

At the suggestion of Asa Gray, Charles Wright visited the Southwest in 1849, and again in 1851-52, for the purpose of making botanical collections. He collected plants mostly in the vicinity of Santa Rita and the Organ Mountains, New Mexico, and several of the plants bear the specific name *Wrightii* in honor of him. Another explorer, especially interested in birds, was G. A. McCall, who in the fall of 1849 and spring of 1850, left San Antonio, Texas, came west from Devil's River to the Rio Grande which he followed northward, and eventually reached Santa Fe and Las Vegas.

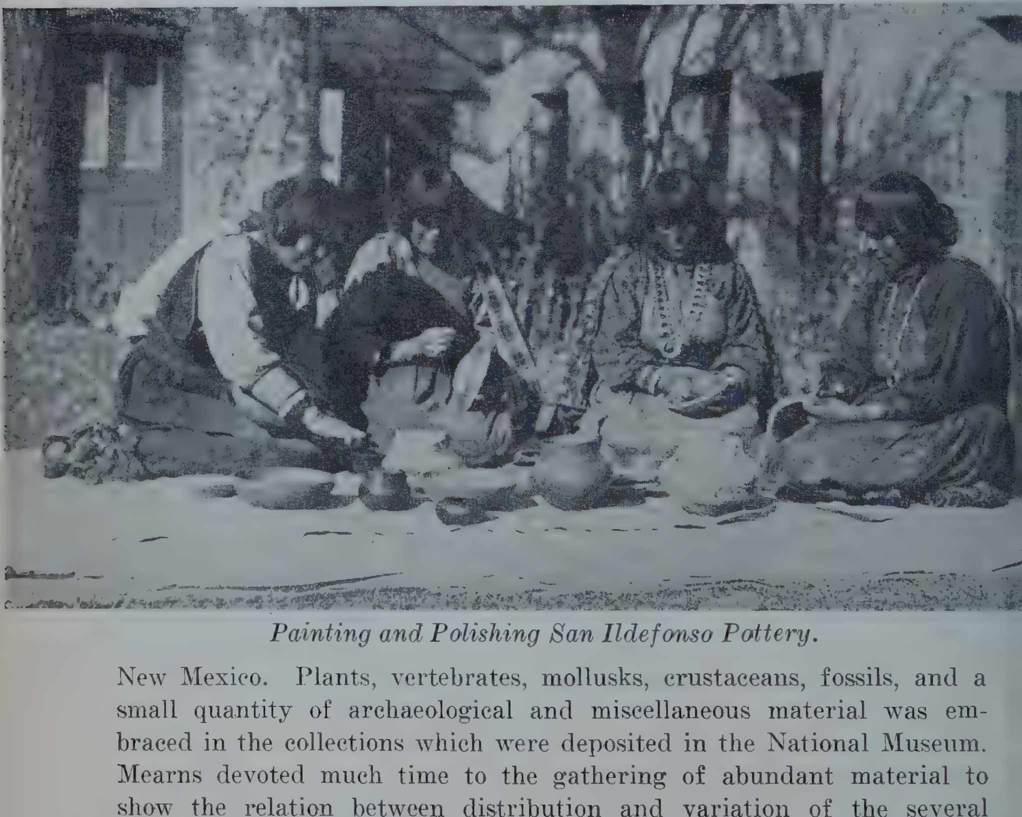
When Captain Sitgreaves explored the Zuni and Colorado Rivers, Woodhouse accompanied his party as physician and naturalist, and visited a number of points in New Mexico. His observations on the natural history were published briefly in the report of the Sitgreaves expedition in 1853.

Another Federal expedition, known as the Whipple expedition, was sent out in 1853 to survey the route for a Pacific railroad from the Mississippi River. C. B. R. Kennerly accompanied the group as physician and naturalist, although he did not join the party until it reached Albuquerque. The naturalist, H. B. Mollhausen, accompanied Lieut. Ives' party, which had come up the Rio Grande from El Paso and arrived in Albuquerque where the two groups met Oct. 6. The entire group was together in the vicinity of Albuquerque from Oct. 6 until Nov. 8, as well as at other points in the state. Dr. J. M. Bigelow, as botanist for the expedition, made extensive collections chiefly east of Albuquerque. Later he collected in southwestern New Mexico and several species of plants are named in honor of this inveterate collector. His published reports present an abundance of valuable information on the natural history of New Mexico.

The Pope expedition and the Parke expedition, both in New Mexico for short periods in 1854, made only casual biological collections.

In connection with the Goegraphical and Geological Explorations and Surveys west of the one-hundredth meridian, H. W. Henshaw spent a considerable amount of time in New Mexico in 1873 and collected biological specimens in various parts of the state. The work was continued in 1874 by a party consisting of Henshaw, Dr. J. T. Rothrock, and J. M. Rutter, and many observations were made, notes taken, and specimens collected on biological phenomena including the securing of many specimens of birds. Again in 1883 Henshaw and Nelson made extensive collections in the mountains east of Santa Fe.

Dr. E. A. Mearns was a major and surgeon in the U. S. Army, who for nearly three years, 1892-94, was a member of the International Boundary Commission, and obtained authority to establish a biological section of the survey of the Mexican Boundary region, and during 1892-93 Mearns traversed the entire length of the southern boundary of



Painting and Polishing San Ildefonso Pottery.

New Mexico. Plants, vertebrates, mollusks, crustaceans, fossils, and a small quantity of archaeological and miscellaneous material was embraced in the collections which were deposited in the National Museum. Mearns devoted much time to the gathering of abundant material to show the relation between distribution and variation of the several species. Mearns quail is named in honor of this intrepid investigator. At the same time, 1893-94 Ernest Thompson Seton was riding the range in eastern Union County, New Mexico, hunting bobcats, wolves, and coyotes, and especially commissioned to destroy the Currumpa pack of gray wolves for the L. V. Fitz-Randolph L F Ranch. During this time he incidentally collected and made notes on numerous species of animals in the "Brakes of the Cimarron" and in the drainage of the Canadian River.

It is evident from the foregoing account that the biological work of these early explorers was pursued from the viewpoint of naturalists.

We have touched only upon those students whose work has been of considerable importance, for space does not permit the discussion of the numerous minor explorations and expeditions into New Mexico. We shall, therefore, hasten to consider a few remaining figures of outstanding merit, and whose work gave a different orientation to the course of biologic thought and work in the state, namely a more definitely integrated and comprehensive treatment of biological knowledge.

Vernon O. and Florence Merriam Bailey have left an indelible impression upon the biology of New Meico. Mr. Bailey, connected with the Biological Survey, began his work in the state in 1889 and continued at intervals until 1924. The most notable of his numerous contributions to the flora and fauna of the state consist in his publications; ''Mammals of New Mexico'', ''Crop Zones and Life Zones in New Mexico'', ''Bats of the Carlsbad Cavern'', and ''Animal Life of the Carlsbad Cavern'', while Mrs. Bailey's enduring contribution is ''Birds of New Mexico'', in the preparation of which she was assisted by many collaborators who have worked in the state.

Along lines of investigation similar in nature to that of the Baileys are the noteworthy efforts of J. Stokley Ligon, and Aldo Leopold, the former was associated with the Biological Survey, the latter, the Forest Service. The work of these men was given a definite applied orientation in the direction of conservation, and game and fish management, although not limited to such, both, for example, having an abiding interest in non-game birds. Ligon's ''Wild Life of New Mexico'', although written largely from an applied viewpoint, shows a mastery of a combination of applied and purely scientific knowledge rarely encountered. The numerous publications of Leoplod on game and non-game birds in the state present a most enviable list.

The collections of plant and insects in New Mexico by T. D. A. Cockerell over a long period of time may be regarded as one of the biological landmarks of the state. Finally, two more names stand out in the State's biological history--Paul C. Standley and E. O. Wooton. While Coulter's ''Botany of Western Texas'' contains descriptions of a majority of the plants of southeastern New Mexico, and Rydberg's ''Flora of the Rocky Mountains'', as well as Coulter and Nelson's ''Rocky Mountain Flora'', cover a portion of the flora of the northern part of the state, the only work treating specifically the flora of New Mexico is Wooton and Standley's ''Flora of New Mexico''. In addition to this important work these two investigators have published a number of other very valuable papers on various aspects of New Mexican flora, not the least useful of which is Standley's ''bibliography of New Mexican botany''.

LIFE AND BIOLOGY

BY DR. AMBROSE ABRAHAM

(EDITOR'S NOTE:—*Those who know the field of cellular physiology are aware of the constant flow of significant research which for years has emanated from the laboratories of Prof. Dr. Ambrosius Abraham, formerly at the University of Buda Pesth, now on the staff of the University of Szeged, Hungary. His research appears in noteworthy European scientific periodicals, and not infrequently is abstracted in "Biological Abstracts." The Editor of "The Biologist" has corresponded with Dr. Abraham over a period of years, and regularly sends him the Phi Sigma quarterly. It was, however, an agreeable surprise when the following unsolicited article, written especially for "The Biologist" was recently received. The casual reader will not need to be told that Dr. Abraham here presents the sensitive, poetical, and religiously philosophical side of a scientific personality which is distinctively Hungarian. Coming as it does in a time when the world's interest is focussed on his native land, this is a doubly interesting contribution.*)

WHEN man, tired of the struggles for everyday life gives himself an account of his husbandry, judges his deeds, counts his few joys and enters the tax paid on them into his account, three questions occur to him, the answers to which are expected in vain: From where have we come? Why are we here and where are we going to? These three questions are as old as man himself, and the certain, calming scientific answers that may be given to these, are still left unsolved.

From whence have we come? Why are we here and where are we going to? We were born, we suffer, we die, and, being parts of the great Universe, we become transformed, for we are only signposts in the continuity of the germplasma and only therefore have the right and are obliged to live, to ensure the continuance thereof. We are nourishers of a wonderful fire blazing up to unforeseen times. We are derived of elements and become these again as the great laws ruling nature apply to us also. We rush along the dusty, uneven highways until we are stretched bleeding in the dust of the road.

Answers in the shapes of shadows sitting on the bank of the river Styx prey on the mind of every thinking man who in the rush of life stops for a moment, but especially prey on him who spends his life within the walls of the laboratory, where seemingly everything is rigid, everything is gloomy, but in reality has all the more warmth and is the source of absolute pure joy. It sounds strange, but it is true, that we who devote our lives to the furtherence of the Science of Life, who leaning over the lens of the microscope search and work in order to enlighten others, are absolutely unable to give instructions on the questions of the great problems of life. And still how often have words like these been addressed to me both with envy and wonder ''How happy you are, who are occupied in Biology for you know everything that gives us cause for so much restlessness and meditation''. Are we happy? What shall I reply? Shall I say we know nothing, or should I put on the dark mask covering all and be glad when others believe that we who are occupied in the Biology actually see life free of secrets? Shall I try to make people believe that to us the rose is redder and its smell is sweeter, because we know it derives its colour from the anthocyans and its smell is produced in the veins of lyzigen; that the bird sings sweeter to us, because we know that in the structure of the syrinx not only the last rings of the windpipe but the first bronchial rings also operate: that in our lungs the oxyhaemoglobin is being improved, because we know that after birth there are also seedless epishel cells in the breathing epishel, the rythm of our heart is more even, because we know that in the striated muscles at the formation of the Keith-Flake and Tavara knots, that there is much sarcoplasma and little myofibrilla, that our nervous-system is sounder, for we know that the neurofibrilles have a leading part, and that the neurons are in contiguity, that our feeling in general is calmer, because we know that our hormon-producing organs are neither in hyper nor hyperfunction, that our hearing is more perfect because we know that in the perceptive haircells existing embryonial fibres are not in contiguity with the endbranches of the nerve of hearing? Why shall I continue? I give credit to Tivadar Huzella who formulates the old scholastic saying to the serious delver: *''Fides querit intellectum''*—faith seeks for intellect''—*intellectus querit fidem''* intellect seeks for faith. I admit, there may be some who may have different views on the above questions, but, being always led by the greatest objectivity throughout my scientific researches and formation of judgments and exercising the strictest critical deliberation, I cannot help thinking thus. He who places himself among the serious students of biology and who feels that he is standing upon a summit above which none of the combatants can rise, may not fill the souls of others with coloured stories and vain phantasies. I too know very well that there are many analogies existing in the world in the shape of artificial cells, liquid crystals, Leduc-kind of artificial plants, solution of the brain and other matter. All this is very nice, and with the iceflowers which take form on the train windows in cold winter approach that external structure to which life is united in such an unintelligible way, have only one fault, namely that they are not alive.

The modern microscope, under the splendid lens of which by a 3600-fold enlargement day after day I have the opportunity of looking at the fundamental elements of the organism, displays many tiny particles living seperately and in groups aiming at the realm of life, only not pointing out what is life. To quote the great physiologist Mulden's splendid comparison: "I know the house, I know who enters into it, I know who comes out of it, how much smoke leaves the chimney and how much water leaves the gutter, only one thing I do not know, what the tenants inside speak about."

Under the lens of a microscope in a few drops of water the slipper animalcule, paramaecium composed of one cell, is moving, floating and swaying. The bright belts along its body vibrate, the tactile hairs are in operation, the contractile vocuole is filling, throbbing, emptying, the narrow opening of the mouth widens, the oblong phranyx, the food cavity wanders, the protective enwrapping threads are moving, the poison weapons are ready on the defensive, the macronucleus falls to pieces, the micronucleus is ready for division, the rejuvenescence is on its way and after the Spring follows joy and life. And when a few drops of chloroform enter the water, motion is over. The clock runs down, and the Watchmaker who can wind it up again—is not one of us. We can only spoil the clock. The heart of man is beating, the auricles and ventricles are in operation, all the numerous blood vessels are throbbing. In small brooklets little red disks, little boats of life are coming and going, carrying food to all other tiny units of life, giving liberty to them. They are going on, in 4 weeks they stop and have reached the cemetery. New little red disks are forming, they start, they come and go, in 4 weeks they stop and have reached the cemetery. Little white extending wanderers are crawling slowly, they are attentive, they stop, they pave the way, they clean, they eat, they die of food and the great organism moves: man lives. In the medulla oblongata the fire ceases burning. The left auricle relaxes, contracts and then the right one. The left ventricles draws together for the last time and the right one stops too. The clock has run down, life has stopped, the Watchmaker is not one of us.

> "The little brook that drives the heart, when dried up, cannot be replaced by an Ocean of blood."

And life advances. New hearts throb, new cradles and new coffins are being made.

The Spring comes, the Autumn comes and man with broken limbs, with dishevelled hair, with a heaving bosom, is standing on the large stage of life. And even today he is as he was when the creator of the universe sent him on him way,—Man who is never cleverer, never better and is not worse, is simply a man. There are neither angels nor devils on earth, but there is man suffering, bleeding, struggling with the invisible powers of nature, who according to St. Paul sees such laws in his limbs that contradict the laws of his sense. There is man who struggles with life, with the earth, with water, with fire, with himself until he falls to earth with bleeding head and exists no longer. The spring has stopped, the clock has run down, the Watchmaker is looking at it, judges its structure by its past but does not repair an old spring.

The leaves are rustling on the willows of the banks of rivers, the woodpecker pecks at the hollow bark of the willows. The bare branch blown by the wind is knocked against the trees. In the parktown of New Szeged the roses are gone, mist is hovering over the rivers Tisza and Maros, also over the piles of maizestalks and the fallen foliage is rustling under my feet. It is Winter, it is quiet, in my soul memory prevails. I am dreaming, for we Hungarians whose soul is full of the sweet flavour of the heath, with the melancholic music of the rustling woods, can dream so well, can think so well "of past times, of the flowers that have withered".

On the surface of "fair river Tisza" bubbles are moving, speaking and touching each other. Wild geese are flying in the sky, they gabble and vanish. Clouds are slowly floating in the sky. The owl is hooting in the old church-tower. Star Venus returns, it shines, it wanes, and finally vanishes at dawn. "We have come in order to disappear" says the greatest living Hungarian lyrical poet with whom I have in common not only the white cassock worn by members of our community, but also in the feelings of our heart.

We searchers of life look at the clocks, we study their mechanisms, we spoil them, we teach others to do so; what is spoiled, we are unable to repair, "that is all". The Watchmaker is living, he is making new watches, and man believes.

Time elapses, days change, foliage sprouts, the flower blooms, the leaf falls, bones calcify, joints crack, instruments of life wear out, wrinkles deepen, the back curves . . . man hopes. The sun shines, the crop ripens, the heart beats faster, the bird sings, the little brook splashes, peace calms, man really loves "A little joy, a little hope and then good night".

"Earth covers earth and this is the fate of us all", sounds the song along the slopes of blue mountain Hargitta on the lips of an old Szekely ploughman to whom life has most firmly united me.

If we, who are on the way that leads from the cradle to the grave are frequently affected by uncertainty and by the thought of the sad end, want to answer the great questions referring to the essence, the meaning, and the aim of life, we have to ascend higher, there, where the dissecting-knife, the microscope, the scissors and the tweezers do not follow us. Someone lives who has lived, who is living and who will live, to whom we owe our thinking brain meditating in vain over the serious problems of existence. Someone lives at whose call we were created and according to whose wish our hearts will cease to throb. Someone lives before whom only a scientist who instructs, who studies, who spoils the watches, can bow with deepest reverence, to whom he can look up with greatest admiration, who is the founder of the Science, called the Science of Life.

EDITORIALS

Whither Evolution?

IN their life cycles organizations represent definite stages in the evolution of society, just as the normal organism represents some stage in the evolution of the type. The vitality of an organization can be measured in proportion to the way it serves the similar units in the community in which it is placed. Chapters of Phi Sigma can be and are being measured by some such standards as these. On every campus there is a certain level of socially desirable and intellectually helpful activity which, if our local chapter attains it, it is at once esteemed as an asset to the campus. Some chapters are not satisfied to merely reach the local level set by other organizations. They forge out for themselves, they leave no stone unturned in building their reputation for service. Other chapters haven't gotten out of ruts in which they have been monotanously travelling since the days immediately succeeding the World War.

As a result of natural attrition, therefore, chapters adhering to a routine tradition which is not productive, or an incentive to high scholarship and a research spirit, gradually atrophy and die out. This is, of course, regrettable from the standpoint of those who want "a bigger and better" Phi Sigma,—but it is as natural and inevitable as any other ecological process.

It is not hard to see, therefore, why such a divergence in theory and practice, or policy and program, amongst the many chapters of Phi Sigma comes to the surface at each succeeding National Convention. Delegates almost inevitably register their surprise that there is not more uniformity between chapters.

If Phi Sigma were designed to form on every campus the identical social tissue there might be some justification of for a wholesale national movement to standardize its policies rigidly. This would mean the plasmolysis of such chapters as existed on campuses where there was no opportunity for them to carry out the standardized policies.

Fortunately, this has not yet become necessary. It is to be hoped the vitality of each chapter, the foresight of its offices, will not necessitate it for years to come.

On Annual Programs

MORE and more, the office of your Editor is receiving printed or mimeographed programs published by the chapters shortly after the opening of the school year. These annual programs are always well gotten together. Some are humorous. Some show a high degree of technical or artistic ability. All are more than ordinarily interesting, giving, as they do, evidence of the not inconsiderable foresight and care devoted to planning the forthcoming year's activities.

This is a healthy sign. An aggressive group of chapter officers who can deliberately plan their program for a year in advance, are not going to let their school, fellow students, their chapter or Phi Sigma down. Instead of batting around from pillar to post in periodic flurries of high pressure excitement, as some chapter officers are, trying to secure speakers or programs for the next meeting, these prudent officials have their problem settled within a month of the reopening of their school year. Thereby, they reflect honor and credit on their chapter, and deserve the well merited esteem of their fellow Phi Sigma members. Perhaps the sincerest form of praise they might receive would be the imitation of their efforts by other chapter officers thruout the country.

Welcome, Alpha Omicron

THE thirty-ninth chapter of Phi Sigma, Alpha Omicron was formally installed at Marquette University, last June, the Editor of *The Biologist* acting for the National Council as installing officer. Twenty-nine graduate and undergraduate students were received into the organization at the time.

Marquette University is one of the largest education institutions in the State of Wisconsin, being second only to the state university with which it is on most friendly terms. Situated in the heart of Milwaukee, the metropolis of the state, it has made great strides since it was founded, and bids fair to grow in size and importance as the years roll on.

The new Marquette chapter has an effective group of officers, a healthy membership, and prospects for a splendid future before it. It is welcome in Phi Sigma, long may it flourish.

Give Them A Chance

ONE of the most brilliant suggestions ever made at any convention was voiced at last year's Indianapolis meeting. It deserves to be repeated here,—and put into practice. Briefly, it is that chapters take under consideration the policy, whenever possible, of paying out of their own treasuries the initiation fee for one or more worthy but indigent students who would otherwise be unable to accept an invitation to enter Phi Sigma. This can be done unobtrusively. It does not need to be advertised to the embarassment of the prospective member, but can be committed by chapter vote to the discretion of the membership committee without anyone being any the wiser. As an altruistic and thoroughly generous action hardly anything of more worth could be imagined.

Ahoy There, Chapter Secretary!

AS you take over the most responsible office in your chapter, accept the salutations of one who knows by experience what you are up against. Yours is the key office in your chapter. You can make it or break it. That you have been elected to office is proof that your fellow members had enough confidence in your ability to want you to make your chapter the best in the land.

Not so long ago you received a five-page instruction letter from the National Secretary, Dr. A. I. Ortenburger, at the University of Oklahoma. Keep that letter on hand, read it over from time to time, follow its instructions carefully. Just by way of a summarizing reminder, we have digested the Secretary's instructions and carry them on the inside rear cover of each issue of *The Biologist.*

Have you talked over with your chapter the possibility of helping us devote an issue of *The Biologist* to your school somewhat like this New Mexico issue, or last years two featuring the Universities of Wisconsin and Michigan? If you have had a favorable response please contact the Editor. We shall be glad to devote an entire issue to each larger university, smaller schools may double up, two or three to an issue.

And, by the way, don't forget your Chapter News Letter for the next issue is now due.

CHAPTER NEWS LETTERS

Beta—Michigan

President—John Brookhart, Dept. Physiology, U. Mich., Ann Arbor, Mich.
Vice-President—LeRoy Harvey, Dept. Botany.
Secretary—Grace Orton, Dept. Zoology.
Treasurer—K. Eugene Goellner, University Museums.

Epsilon—Denver

President—Robert Searway, 2175 S. High St., Denver, Colo.
Vice-President—Charles Hansen.
Secretary-Treasurer—Helen E. Dowling, Dept. Anthropology, Univ. Denver, Denver, Colo. (or 3432 West 33rd Ave.)

Zeta—Wisconsin

President—Gordon Worley, Memorial Institute Building.
Vice-President—David G. Frey, Biology Building.
Secretary—Robert H. Burris, Agricultural Hall.
Program Secretary—Robert M. Stern, Agricultural Hall.
Treasurer—Marcus I. Wegner, Agricultural Chemistry Building.
Editor—John W. Thomson, Jr., Biology Building.

At the spring banquet on May 16th twenty-four new members were initiated into Zeta Chapter. They are as follows: Edward J. Backus, Leslie D. Beadle, Karl H. Beyer, John W. Boyes, Vernon C. Brink, Clyde Ervin, Lynn L. Gee, Donald S. Farner, Francis E. Fontaine, Kenneth Karsten, Robert L. Krause, Willard L. Langhus, Sylvan B. Lee, Lewis B. Nelson, Raymond D. Owen, Shang-Cheng Pan, John C. Pfeffer, Allen S. Phelps, Nelson E. Rodgers, Russell B. Stevens, Richard K. Tam, Philip M. West, Orville Wyss, Fred R. Zimmerman. This is the largest group of new members to join our chapter in several semesters.

Following the banquet, the address was given by Prof. M. F. Guyer of the Department of Zoology of the University. Prof. Guyer read a series of humorous, satirical essays entitled ''Letters of a Scientist to the King of Moronia''.

Our first meeting of the year will be held on Thursday next, October 6th. It will be a business meeting to discuss the activities for the coming year.

John W. Thomson, Jr.

Iota—Washington University

Treasurer and Act. Secretary—Thomas Johnson, Dept. Botany, Washington Univ., St. Louis.

Kappa—Kansas

President—Max D. Wheatley, 216 Snow Hall, Univ. of Kansas, Lawrence.
Vice-President—Rufus Thompson, 415 Snow Hall, Univ. of Kansas, Lawrence.
Secretary—Mildred Purcell, 1334 Ohio, Lawrence, Kansas.
Treasurer—Virginia E. Detlor, 1244 Rhode Island, Lawrence, Kansas.

Our spring initiation banquet was held Thursday, April 21, 1938 at the Evan's Hearth, at which time the following initiates were elected into membership:

Bacteriology—Mr. Clarence Brumback, Miss Dorothy Morgan, Mr. Thomas Hayes.

Biochemistry—Mr. Paul Binter.

Physiology—Mr. Louis Cohen, Mr. Bruce Roesler.

Zoology—Mr. Percy Carruthers, Mr. Gerald Pees, Miss Mildred Purcell, Mr. James Sprague.

Faculty membership—Mr. Richard Marsh.

After the banquet and initiation ceremony we adjourned to the auditorium of Frank Strong Hall to hear Dr. R. W. Gerard of the Department of Physiology of the University of Chicago speak on "Electrical Activity of the Brain".

The committee on the Phi Sigma Scholarship Medal Award was composed of Dr. H. W. Horr, Dr. Kenneth Siler, and Dr. Laurence Woodruff. The medal was presented to James Sprague, a member of the senior class in the Department of Zoology.

MILDRED PURCELL, *Secretary*

Lambda—Montana

President—Laurence Osburnsen, Missoula, Montana.
Vice-President—James Whilt, Missoula, Montana.
Secretary—Aloha Hannah, Missoula, Montana.
Treasurer—Bernard Brink, Missoula, Montana.

Mu—California

President—Dilworth D. Jensen, Dept. Entomology, Univ. Calif., Berkeley, Calif.
Vice-President—Eldon Gardner, Dept. Zoology.
Secretary—Beryl O. Schreiber, Dept. Botany.
Treasurer—John W. Johnson, Dept. Entomology, Agric. Hall.

We had a very, very successful initiation banquet March 24th. Everything went off in great style, the attendance was fine, a new record of over ninety for us. This included the thirty-three initiates as follows: Honorary:—Charles A. Kofoid, William A. Setchell, William E. Ritter. Active:—Anatomy,—Evelyn May McNell; Bacteriology,—Olivia M. Burrows, Orville Joseph Golub, Wm. Theron Hudspeth, Abdul Majid, Thomas B. Merson, Benj. Vincent Siegel; Entomology,—Larry H. Carpelan, John Anthony Downes, Deane Philip Furman, Edgar E. Gehrhardt, John Edward Hare, Kenneth LeF. Maehler, Albert Raymond Mead, William Carlisle Reeves; Faculty,—Guy Franklin MacLeod; Fruit Products,—Clair Alexander Weast; Genetics,—Charles Osgood Blodgett; Household Science,—Dorothy Vida Rundle; Medicine,—Henrik Leo Blum; Paleontology,—Joseph Tracy Gregory; Physiology,—Willis George Watrous; Zoology,—Frances Carter, Joy Barnes Cross, Francis Joseph Gay, Robert Worth Hiatt, Marjorie Selby Lee, Elizabeth Bailey Miller.

We had around fifteen faculty members and some wives, as well as those listed on the program including Dr. Goldschmidt from the Omega Chapter, Dean Lipman, Profs. Essig, Herms, Shaw, etc.

Dr. MacLeod, of Cornell here on sabbatical, was especially good as toastmaster. Dr. Chaney's talk was illustrated with colored slides and was immensely enjoyed. Dr. Ruthven's name of course speaks for itself. He spoke on "Organization of Research."

The program was as follows:

Initiation Ceremony............Paul H. DeBach.
Response for Initiates............Francis J. Gay.
Guest of Honor: Dr. A. G. Ruthven, National President of Phi Sigma.
Speaker: Dr. R. W. Chaney—"Fossils and Fighting in China"
Toastmaster............Dr. G. F. MacLeod.

Altogether it was the most successful and impressive initiation we have had, due of course in a large degree to Dr. Ruthven's presence.

We have just had the cut made of the Phi Sigma coat of arms used on the menu and are quite proud of it.

PAUL H. DE BACH, *President.*

Nu—Washington and Jefferson

President—F. H. McNutt, Jr., Lambda Chi Alpha, Washington, Pa.
Vice-President—Garriel Marino, Caldwell House, 140 E. Wheeling St., Washington.
Secretary—R. C. Montgomery, 432 E. Chestnut St.
Treasurer—H. G. Grether, Caldwell House, Washington.

Pi—Emory

President—Merrill Lineback, 605 Seminole Ave., Atlanta, Ga.
Vice-President—Dorothy Lunsford, 1614 N. Decatur Rd., Atlanta, Ga.
Secretary—Mary Stipe, 1161 Ponce de Leon, Atlanta, Ga.
Treasurer—Charles Uhl, 1063 E. Clifton Rd., N. E., Atlanta, Ga.

Rho—Illinois

Secretary—Robert C. Rendtorff, Entomology Dept., Univ. Ill., Urbana, Ill.

Sigma—Florida

President—John R. Preer, 335 N. Washington St., Gainesville, Florida.
Vice-President—Wilbur B. DeVall, School of Forestry, Univ. Fla., Gainesville, Florida.
Secretary—Charles Benton, 1436 W. University Ave., Gainesville, Florida.
Treasurer—Kenneth Smith, Biology Dept., Univ. Fla., Gainesville, Florida.

Tau—Duke

President—E. S. Luttrell, Botany Dept., Univ. Durham, N. C.
Vice-President—Mangrum, Zoology Dept.
Secretary—V. G. Watkins, Forestry Dept.
Treasurer—Catherine Goffin, Zoology Dept.

Upsilon—Miami

President—Charles Heintzelman, 12 N. Elm St., Oxford, Ohio.
Vice-President—Ann North, 19 Hepburn Hall.
Secretary—Roger Harned, 16 S. Poplar.
Treasurer—William Lunsford, 42 Swing Hall.

Phi—New Hampshire

President—Philip C. Harvey, Durham, N. H.
Vice-President—Hilda Batchelder, Durham, N. H.
Secretary—Wendell Pratt, Durham, N. H.
Treasurer—J. R. Thompson, Durham, N. H.

Psi—University of Washington

President—Joe R. Goodman, 4511 20th N. E., Seattle, Wash.
Vice-President—Clifford Jay Burner, 1724 Hanford.
Secretary—Ruth E. Coats, 4755 22nd N. E.
Treasurer—Harriet Ruth Smith, 5218 17th N. E., Seattle, Wash.

Omega—Oklahoma

President—William Falkner, Botany Dept., Univ. Okla., Norman, Okla.
Vice-President—Elaine Walker, Zoology Dept., Univ. Okla., Norman, Okla.
Secretary—James Smith, Zoology Dept., Univ. Okla., Norman, Okla.
Treasurer—Paul Smith, Botany Dept., Univ. Okla., Norman, Okla.

Omega of Phi Sigma took a prominent part at Oklahoma University, in the program for the dedication of the new building for the biological sciences on Friday, March twenty-fifth, nineteen hundred and thirty-eight. At 6:00 P.M. the Phi Sigma initiation took place in the Union Building, at which the following were initiated: Dr. Lorande Loss Woodruff; Honorary membership. Fall initiates are Thomas Baskett, Jean Corene Baxter, William Falkner, Martha Flowers, Mary Virginia Graham, John Harms, W. A. Hetherington, J. Dennis Norman, Kenneth Richter, Lillian Harris Robinson, Mary Frances Settle, and James Smith. Spring initiates are Paul Darden, Worth Gross, Reginald Hocker, Ruth Irby, Dorothy Van Dyke Leake, William McPheron, Rose Mussa, Donald Olson, and Elaine Walker. This was followed at 6:30 P. M. by the Phi Sigma annual dinner in the Union Ballroom. At 8:15 P. M. the Phi Sigma lecture was given in the Engineering Auditorium, by the newly initiated Professor Lorande Loss Woodruff, Yale University, who spoke on "Paramecium, Past and Present."

On Saturday, March the twenty-sixth, at 10.00 A. M. the dedication exercises, at the Business Administration Auditorium took place, Professor Aute Richards, Department of Zoology, presiding. The dedication lecture, "Philosophers in Little Things" was given by Dr. Lorande Loss Woodruff. This was followed by the dedicatory address, "The University, Biology, and the State" by President William Bennet Bizzell. At 12:30 P. M. there was a luncheon for guests of the university, in the Woodruff Room, Professor George Lynn Cross, Department of Botany, presiding. Greetings from the State Colleges were presented, and Professor Roy Winfield Jones, Central State Teachers College spoke on, "A Biologist's Views Teachers and Teaching." Greetings from the endowed Colleges were next voiced by Professor J. Clifford Shirley, Phillips University who discussed, "A Biologist's Land of Opportunity." The final greetings from the Oklahoma Agricultural and Mechanical College were brought by Professor F. A. Fenton, in his address, "An Economic Entomologist Afield in Oklahoma." At 2:30 P. M. there was an exhibition of work in Botany and Zoology and inspection of the building for the biological sciences. The dedication ceremonies closed at 3:30 P. M. with a reception in the Biology library.

Biology was introduced into the University of Oklahoma in the spring of 1893, the first academic year, as a course in botany, taught by Dr. Edwin DeBarr, who later offered also physiology and zoology. In 1898, under Dr. A. H. Van Vleet, a new Department of Biology and the Territorial Natural History Survey were organized. Nine years later this department was divided, Dr. Van Vleet becoming Professor of Botany, and Dr. H. H. Lane, Professor of Zoology. There are now on this campus four departments of biology, of which zoology and botany are housed in the new Building for Biological Sciences. The present organization of the Department of Zoology dates from 1920 when Dr. A. Richards became head of the Department. The new head of the Department of Botany, Dr. George L. Cross, has just succeeded Dr. Paul B. Sears, who held that position from 1927 to the present year.

The first unit of the Building for Biological Sciences is designed for the ultimate use of the Department of Zoology, when another unit is provided for botany. Planned by the architect, Professor Joe E. Smay, to provide adequate laboratories and accommodations for special experimental equipment and storage of scientific collections, it harmonizes with the other collegiate Gothic buildings on the campus.

The laboratories, offices, classrooms, and library occupy the basement, first and second floors. The sub-basement, a special necessity in our southwestern climate, provides more nearly equable temperature and humidity for important study collections of insects, of bird and mammal skins, and of crustaceans, fishes, amphibians, and reptiles. Here also are the alcohol vault, a fumigating room, storage rooms for laboratory materials, constant temperature rooms, and photographic dark-rooms. On the top floors are research cubicles for graduate students, an operating room, and two large, well-lighted rooms, the west one occupied by the herbarium, and the east by the exhibition museum of zoology. The corridors also add space for museum displays.

Alpha Alpha—Southern California

President—Nathan E. Carl, 1587 W. 45th St., Los Angeles, Calif.
Vice-President—Mrs. Ura T. Jensen, 1220 W. 30th St., Los Angeles, Calif.
Secretary—Elaine Adams, 9725 Regent St., Palms Sta., Los Angeles, Calif.
Treasurer—James L. Aiken, 5433 7th Ave., Los Angeles, Calif.

The Spring Initiation-Banquet for Alpha Alpha Chapter of Phi Sigma was held Friday evening, May 13, 1938, in the Town and Gown

Foyer, University of Southern California. The following persons were initiated into the society at the formal initiation:

Granville Ashcraft
Mary Jo Davis
Helen Eastman
Fenton Feeney
Roderique Gravelle
Harry Jankiewicz
Robert Knowles
Valoris Layne
Lyna Young

Following the initiation and banquet, the Ph.D. candidates, Mr. R. L. Rutherford, Mr. H. Blunden and Mr. Drake, presented their research problems to the group. Following this, the society was extremely fortunate to hear a most interesting illustrated lecture presented by Dr. Calvin B. Bridges, geneticist from the California Institute of Technology. Dr. Bridges is nationally known for his researches in the field of heredity.

The newly elected Chapter officers were then installed.

Dr. Bruce M. Harrison was made Faculty Sponsor, in place of Mrs. T. Clare, who has gone East to continue her studies for a period of time.

Miss Ruth Huff was awarded the Phi Sigma prize for outstanding work in Biology.

Sincerely yours,

ELAINE ADAMS, *Secretary*

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Alpha Mu—Oregon

President—Clara Chapman, Dept. Botany, Oregon St. College, Corvallis, Ore.
Vice-President—Dr. Alfred Taylor, Dept. Zoology, Oregon St. College, Corvallis, Ore.
Secretary—Stanley Jewett, Dept. Fish & Game, Oregon St. College, Corvallis, Ore.
Treasurer—George M. Hansen, Dept. Forestry, Oregon St. College, Corvallis, Ore.

On April 25th Alpha Mu chapter sponsored a symposium on the subject, "Whither Mankind?". Such questions as "Is civilization slipping?", "Can Education compensate for physical limitations?", "Can culture control civilization?", were discussed from the standpoint of biological factors that affect mankind's hope of survival, emphasizing man's physical limitations. Dr. O. R. Chambers, discussing the subject from the psychologist's sense, emphasized the intellectual and emotional adaptations which the human race must make to escape self-extinction. The discussions were brought to a close by Dr. Warrington, professor of Philosophy and religion, who recommended the social reforms which in his opinion must be made.

Approximately 350 attended the symposium.

After consultation with the faculty and student committee the qualifications for the recipient of the Phi Sigma award were decided. Any graduating senior who had a weighted all-college grade point average of 3.35 or above and who had completed a minimum of 45 credits in science were considered for the award, the final decision being made on the basis of interest and activity in biology. Clara Chapman, senior in Botany, was the recipient of the medal with a grade point average of 3.81 for 90 credits of Science.

On May 18th 1938 initiation ceremony was held for:

E. Eldon Banfield
A. Burr Black
Howard L. Cherry
Wm. Bridge Cooke
John E. Davis
Maxwell S. Doty
L. Cloudsly French
Carl F. Frost
George M. Hansen
Katherine W. Hughes
Yuk-maan Leung
John R. Perkins
Robert L. Rose
Professor G. V. Copson
Tsai Yu Hsiao

The banquet talk was given by Dr. Roger Williams, Honorary, who spoke on "Chemistry and its relation to Biology". Dr. K. L. Gordon acted as toastmaster.

Alpha Nu—New Mexico

President—Martin Fleck, 704 Ridgecrest Drive, Albuquerque, N. M.

Alpha Xi—Rhode Island State

President—S. Gilbert Blount, Jr., Beta Pi House, Kingston, R. I.
Vice-President—June Mac Knight, Chi Omega House, Kingston, R. I.
Secretary—Elizabeth Leon, Delta Zeta House, Kingston, R. I.
Treasurer—Victor Tkaco, Beta Phi House, Kingston, R. I.

Alpha Omicron—Marquette

President—James R. Neidhoefer, 1529 N. 51 St., Milwaukee, Wisconsin.
Vice-President—Frederick Adler, 928 S. 20 St., Milwaukee, Wisconsin.
Secretary—Robert E. Esser, 2021 S. Layton Blvd., Milwaukee, Wisconsin.
Treasurer—Charles G. Wilber, 1710 W. Highland Ave., Milwaukee, Wisconsin.

Alpha Omicron, the eldest daughter of Phi Sigma, was born at noon of June 18th, 1938 at the Milwaukee Athletic Club under the supervision of the Dr. Anselm M. Keefe (Zeta '24) Dean of the St. Norbert College, West DePere, Wisconsin.

On January 8th, 1938 Professor A. I. Ortenburger, the National Secretary of Phi Sigma wrote to the Reverend Paul L. Carroll, S. J., Associate Professor of Zoology and Director of zoological studies: "I was very much interested in your exhibit of fresh-water sponges shown at the Indianapolis Meeting of the AAAS. I wish to complement you and your department on this fine demonstration. It occured to me that with such an active Biology Department as you have at your Institution, that your students might be interested in establishing a chapter of Phi Sigma."

A petition from those representing the biological sciences at Marquette University was prepared and submitted to the National Council and the individual chapters of Phi Sigma. We have been told that the petition was unanimously passed. On June 18, 1938, 29 charter members were initiated into Alpha Omicron Chapter of Phi Sigma by the Reverend Anselm M. Keefe, the duly appointed representative of the National Council.

The officers of Alpha Omicron Chapter of Phi Sigma are: James R. Neidhoefer, President; Frederick E. Adler, Vice-President; Robert E. Esser, Secretary; Charles G. Wilber, Treasurer.

The following committees have been selected: Program Committee: James R. Neidhoefer, Chairman, Herman Karl, Stephen Chess. Membership Committee: Frederick E. W. Adler, Chairman, Joseph Wocasek, Richard Pohl, Henry Twelmeyer. Auditing Committee: Charles G. Wilber, Chairman, Harold Joseph, Laverne Penn. Banquet Committee: Donald Greiff, Chairman, Darwin Kaestner, Joseph Jauquet.

The first formal meeting of the scholastic year of 1938-39 was held in Science Hall on Monday evening, October 24th. The following program was announced for the coming year.

October 17th, 1938—Possible therapeutic reactants of cold liver oil.
Mr. Herman Karl

November 21st, 1938—Recent developments in Neuro-Anatomy.
Dr. Clement Fox

December 12th, 1938—An anomalous inferior alveolar nerve.
Mr. Stephen Chess
January 16th, 1939—Schleiden-Schwann Centennial celebration of the formulation of the Cell-theory.
Guest Speaker
February 20th, 1939—Longevity in Drosophila.
Mr. Donal Greiff
Role of fatty acids in biological processes.
Mr. Joseph Wocasek
Infection of the Cribiform plate.
Mr. Everette Nelsen
March 20th, 1939—Symposium on recent advances in biological sciences.
Dr. Alphonse Heun, Leader
Mr. Laverne Penn
Mr. Harry Twelmeyer
Mr. Theodore Van Aachen
April 17th, 1939—Experiment in Mycology.
Dr. E. S. McDonough
May 15th, 1938—Taxonomy of the Rhamales of Wisconsin.
Histology of Fresh-water sponges.
Glands of Bufo americanus.
Richard Pohle
James R. Neidhoefer
Charles G. Wilber

The following program has been prepared for the coming meeting of the American Society of Zoologists at the Richmond Meeting of the AAAS. This presentation represents some of the outstanding work of the department done under the direction of Father Carroll.

1. Histology of the parotoid glands of *Bufo a. americanus* Holbrook. Paul L. Carroll, S. J. and Charles G. Wilber.
2. Cross-section anatomy of *Anodonta grandis* Say and *Ostrea virginica* Gmelin. Paul L. Carroll, S. J., F. L. Mierzwa and H. J. Barnett.
3. *Carterius tenosperma* (Potts), a species of fresh-water sponge recently described as new to Wisconsin. James R. Neidhoefer (Introduced by Paul L. Carroll, S. J.)
4. Some observations on the histology of the digestive tract of the crawfish, *Cambarus virilis* Hagen. Arno F. Michaelis. Introduced by Paul L. Carroll, S. J.)
5. Cross-section anatomy of the hind limb of the frog. Wilfred F. Horner.(Introduced by Paul L. Carroll, S. J.)

ROBERT E. ESSER, *Secretary.*

BOOK REVIEWS

The thumbnail sketches of current biological literature appearing in this section are not meant to be exhaustive or deeply critical. They aim to survey the rapidly growing field of biology. Naturally these reviews represent the candid opinions of various readers not necessarily those of members of the National Council, nor even those of the Editor.

A B C OF THE VITAMINS, Jennie Gregory, *Williams & Wilkins Co., Baltimore, 1938. $3.00.*

Three years ago a similar volume on the endocrines came from the pen of this author. It was a graphically illustrated series of bound charts covering the field of endocrinology. That the visual appeal of such a survey in charts was popular is proven by this new work dealing with the much talked-of and equally as much misunderstood vitamins. On the whole, the author seems to have profited by the experience gained in the previous production. This new work is much less elementary, better organized, and replete with graphic information.

THE AMERICAN BISON, Martin S. Garretson, *New York Zoological Society, 90 Broad St., New York, 1938. $2.50.*

The dramatic epic of conservation at its best as here presented is a standing challenge to the doubting Thomases who wonder if conservation on a national scale "will work." In February 1897 the last wild buffalo in the United States were killed in Lost Park, Colorado. A few scattered small herds, more or less tame, still existed in isolated spots, and small groups were maintained in some of the larger zoological parks, notably in the Bronx Zoo. All in all, there were slightly more than a thousand head in the United States, where there once had been hundreds of millions. Public sentiment was aroused, and as a result, the American bison is on its way back from an extinction which came perilously close to wiping it out as effectively as that which overtook the passenger pigeon, the dodo and many another primitive living form. This book is interesting as well as informative. It should find a place in public as well as educational institution libraries.

ANIMAL BIOLOGY, Lorande Loss Woodruff, *The Macmillan Co., New York, 1938. $3.75.*

This second edition of a justly well-liked text is characterized by one prudent quality which will commend it to all previous and present users. The changes, while sufficient to bring it up to date, are not so great as to render confusion worse confounded when classes, as they almost inevitably do, are found to be partly supplied with the old edition, partly with the new. After all, it is a tribute to the careful work of an author when, after six years of extensive use, he can find so little that is susceptible of drastic change.

BIOLOGY AND MARXISM, Marcel Prenant, *International Publishers, New York, 1938. $2.50.*

It has been said that Karl Marx wrote "Das Kapital" as the logical working out of extreme evolutionism in its application to society. Now that Communism has had a chance to develop itself in its own way,—in the words of the author,—"its every day more brilliant successes in the U. S. S. R.", we are presented with an outstanding thesis by Marcel Prenant on the application of Marxism to Biology. To quote the author's introduction again: "If the book is good, it is because it is a Marxist book and not in spite of it. If it is bad, that is not because it is Marxist, but because it is not Marxist enough."

BIRD FLOCKS AND THE BREEDING CYCLE, F. Fraser Darling, *Cambridge at the University Press; New York, The Macmillan Co., 1938. $1.75.*

Producing this little contribution to our knowledge of the habits and ecology of sea birds required the spending of a winter and spring, living in

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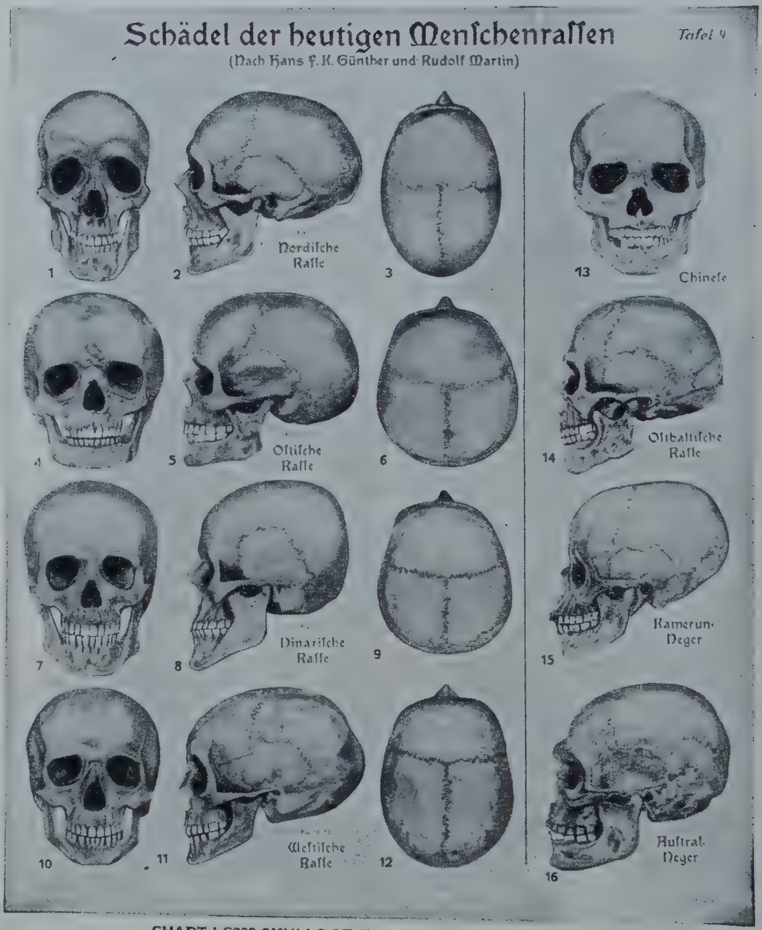

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tents, on the wind swept islands off the north-west coast of Scotland. The results are worth adding to the biological library, either from the standpoint of animal behavior, or for the ecological data here supplied. The three main topics discussed are sexual periodicity, breeding flocks of gulls, and communal courtship. The discussion is valuable, not only for its lack of partisanship for some particular biological philosophy, but for its frank admission that it treats of only a very small part of the whole problem of social behavior.

CHARLES DARWIN, Geoffrey West, *Yale University Press, New Haven, 1938. $3.50.*

The lives of great men merit, and need, constant study, at least for the first hundred years after their deaths. By that time their place in the limelight or the shadows of history should be definitely assured. During that first hundred years those who are to be esteemed truly great will survive the study of the historians, the biographers, the constructive and destructive critics, until their place in the sun is finally recognized.

Geoffrey West's sympathetic picture of Charles Darwin has been aptly termed "A Portrait." As such it is full of the lights and shadows of its illustrious subject's life, truthfully presented, and, happily, lacking in much of the mythology which seems to rise unbidden about the lives and deeds of many of England's great. This is as it should be. Darwin belongs to all the world.

CRYPTOGAMIC BOTANY, Gilbert M. Smith, *McGraw-Hill Book Co., New York, 1938. Vol. I, Algae and Fungi, $4.00; Vol. II, Bryophytes and Pteridophytes, $3.00.*

Only five years ago Dr. Smith made Botany his debtor by publishing his "Fresh Water Algae of the United States." Evidently he was not content to rest upon such laurels as that publication may have brought him. He now presents us with a two volume set of cryptogamic botany which still further puts us in his debt. These works come at an opportune moment. The process of disorganization in course—material goes on as merrily as ever. Even in single departments of instruction overlapping courses are offered by different professors, and whole groups of subjects which by the very nature of things should be considered in their relationships are offered as if they were entirely different sciences. In an age of muddled thinking it is good to feel that Science is beginning to put her own house in order. It may be that other areas of knowledge will follow suit. It is to the credit of American Botany that Dr. Smith has brought back into current use the study of the Cryptogams.

EMBRYONIC DEVELOPMENT AND INDUCTION, Hans Spemann, *Yale University Press, New Haven, 1938. $5.00.*

Hans Spemann, Director of the Zoological Institute in Freiburg has long and favorably been known to the embryological group in American zoology. His new book in the Silliman Foundation Lecture series will therefore be hailed with interest. His concluding statement is significant: "Again and again terms have been used which point not to physical but to psychical analogies. This was meant to be more than a poetical metaphor. It was meant to express my conviction that the suitable reaction of a germ fragment, . . . is not a common chemical reaction, but that these processes of development, like all vital processes, are comparable in the way they are connected, to nothing we know in such a degree as to those vital processes of which we have the most intimate knowledge, viz., the psychical ones." The book is elaborately illustrated, but lacks a subject index.

EXPLORING BIOLOGY, Ella Thea Smith, *Harcourt Brace and Co., New York, 1938. $1.84.*

Here is a new high school textbook which deserves wide circulation. Not unlikely it will prove to be a suggestive reference work for college instructors who seek to enliven their freshman laboratory periods with new and interesting presentation techniques. Divided into nine units, some thirty-four biological problems are proposed for study. The way on which these problems are solved is just a bit unusual. It is safe to say that this is the least stereotyped high school biology text on the market today.

Introduction And Guide To The Study of Histology

185 Illus., 542 Pages, Washable Fabric—$5.00

By Avery E. Lambert, Ph.D.

Professor of Histology, State Univ. of Iowa Medical School

This new book, an expansion of the author's former successful volume, provides a course primarily for students whose objective is not to become histologists but to acquire a knowledge of the subject as a foundation for further study of physiology and pathology or to add a general survey of the subject to a more or less extended course in biology. The text is clear and concisely written and gives comprehensive directions for laboratory study.

THREE NEW EDITIONS

BENSLEY—Practical Anatomy Of The Rabbit. 6th Edition.
91 Illus. 320 Pages. Washable Fabric. **$3.00**

By B. A. Bensley, Ph.D., Revised by E. Horne Craigie, Ph.D., (Univ. of Toronto).

It sets forth in practical sequence a plan for the orderly study of a typical mammal, supplemented by a brief exposition of the relation of this study to the content and outlook of cognate biological sciences.

HALLIBURTON and McDOWALL—Handbook Of Physiology and Biochemistry. 35th Edition.

373 Illus. (Many in Colors.) 4 Colored Plates. 973 Pages. Washable Fabric. - **$5.50**

By W. D. Halliburton, M.D., and R. J. S. McDowall, M.D., F.R.C.P. (Edin.) (Univ. of London, King's College.)
A standard text and reference work in human physiology. It presents the dynamic rather than the static concept of physiology.

LLOYD and SHORE—Chemistry of The Proteins. 2d Edition.
101 Illus. 532 Pages. Washable Fabric. **$5.50**

By D. J. Lloyd, Sc.D., F.I.C. (Director, British Leather Manufacturers Research) and A. Shore, B.Sc., A.I.C. (Lond.)
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FEARFULLY AND WONDERFULLY MADE, Renee von Eulenberg-Wiener, *The Macmillan Co., New York, 1938. $3.50.*

The scientific training and the Viennese philosophical background of the author of this distinctly unusual book give it an additional claim to attention beyond that which its theme and treatment would ordinarily merit. This is no mere human physiology and hygiene text. It is, as far as we have been able to discover, an eminently readable description of "the human organism in the light of modern science" on an extremely higher plane than that achieved by most collegiate and all high school textbooks on the market today. As such, therefore, it falls into the class of valuable references, a book that any well-equipped library can hardly afford to be without. That the title is more poetical than actually descriptive of the true nature of the work is perhaps unfortunate. That the author has not pushed the scientific passion for "objectivity" to the limits of a prosaic dullness fortunately more than compensates.

FOREST TREES OF THE PACIFIC COAST, Willard Ayres Eliot, *G. P. Putnam's Sons, New York, 1938. $5.00.*

There is a very definite place in our taxonomic literature for local studies of regional flora and fauna. Each new accession to the growing shelves of such works is to be hailed with enthusiasm, as opening avenues for a better understanding of our plant and animal resources. This new volume covers the area from Alaska on the north to Oregon on the south, and eastward to the western slopes of the Rocky Mountains. The book is really lavishly illustrated, and an ingenious device of photographing the stems, leaves, cones, or flowers of the various species under an inch-square grid makes the illustrations all the more helpful and valuable, even if it does somewhat detract from the pictorial beauty of the material.

FOSSILS, Richard S. Lull, *The University Society, New York, 1933. $1.00 in cloth, .65 in paper.*

The University Society of 468 Fourth Avenue, New York, has been putting out a series of very readable booklets known as the "Highlights of Modern Knowledge." This volume by Dr. Lull of Yale furnishes an interesting, if somewhat general, survey of the results of modern paleontological research, couched in language any ordinarily well-educated layman could appreciate. There is a handy exploratory reading outline which goes with the work, and which should do much to organize and direct an intelligent study of the book's contents. For scientifically minded study clubs, as well as for high school or public libraries the book will be valuable.

THE GARDNER'S OMNIBUS, Edward I. Farrington, *Hale, Cushman & Flint, Boston, 1938.*

This huge 1000 page volume with over 600 illustrations was prepared for the members of the Massachusetts Horticultural Society. As a result it is distinctly an omnibus with a wildly varied group of passengers, ranging from the more expected horticultural details and data about garden types, and the flowers to fill them with, to cut flower arrangement and the art of photographing flowers. Since man is supposed to have drawn his first conscious breath in a Garden, there have always been numberless humans who have their more or less permanent atavistic reversions to type. To all of them this book will be more than interesting, it will be a veritable treasure trove.

GENERAL BIOLOGY, S. J. Holmes, *Harcourt Brace and Company, New York, 1937. $3.50.*

This is a revision of a well and favorably known text by the professor of zoology at the University of California. Containing one of the largest sections devoted to the discussion of evolution to be found in any of the more popular textbooks, it will probably keep all its old friends and make new ones. One wishes that the Guyer-Smith lens extract episode had been omitted, and a little less stress placed on the Nam-Juke-Kallikak horrors. Sociologists are getting a little tired of the Dugdale-Goddard studies, and with J. B. S. Haldane taking some of his recent cracks at our American sterilization experiments, it may be that we are in for a

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reversal of scientific opinion on some of our pet biological theories. The entire book reads well,—in fact, it is one of the most readable college texts that this reviewer has been privileged to examine for some time.

GENERAL BIOLOGY, P. D. STRAUSBAUGH AND B. R. WEIMER, *John Wiley & Sons, New York, 1938. $3.75.*

Here is a general biological text for college use that is just a bit unusual. It opens with the customary treatment of life processes and devotes the first five chapters to a discussion of metabolism. This is followed by a discussion of heredity and eugenics, and another of plant and animal classification. Then come two chapters on the animal kingdom, and two more on the plants. Next is a chapter on ecology. Discussions on evolution and the relations of biology to other sciences close the book. The illustrations are adequate, and the treatment is clear. This reviewer has still to find a text which embodies many of the practical features of this text, but places the plants in their logical (and geological?) position, before the animals. It is so much easier to treat the botanical forms first, and then build on the knowledge thus given, the higher and more complicated story of animal structure.

GIANT FISHES, WHALES AND DOLPHINS, *J. R. Norman and F. C. Frazer, W. W. Norton & Co., New York, 1938. $4.00.*

Here is a much needed book on the larger species of marine fauna throughout the world prepared by two well-known authorities from the British Museum. It is divided into two parts, the first dealing with the sharks, the rays, the bony fishes, barracudas, remoras and others under the heading of "Fishes." The second half of the book deals with the Cetaceans, and discusses the right whales, the fin whales, the humpback, and sperm whales, the porpoises and the dolphins. The book is scientifically gotten together as well as interesting. The illustrations are plentiful, and many are in color. Altogether it fills a long vacant place on our library shelves. It deserves wide recognition.

HEREDITY, A. FRANKLIN SHULL, *McGraw-Hill Book Co., New York, 1938. $3.50.*

Having more than adequately filled its purpose in the preceding editions, this almost total rewriting of the original work lays new claim to our attention. The validity of that claim is unquestionable. It reads better. The reordering of its various parts seems more logical. It has a reasonably extensive bibliography of recent literature. There is a series of some 660 problems and questions appended to the main text and correlated with it. All in all, it should maintain its position as easily as one of our best textbooks on heredity.

INTRODUCTION AND GUIDE TO THE STUDY OF HISTOLOGY, AVERY E. LAMBERT, *P. Blakiston's Son & Co., Philadelphia, 1938. $5.00.*

In this rewriting of a previous histological laboratory text, the author has expanded the original matter to include brief discussions of the structures the student is studying. Careful examination seems to indicate that here we have a very complete presentation of the matter, with entirely sufficient detail for class work, at no sacrifice of essentials, while still keeping the book down to a reasonably sized volume. The multitude of illustrations are well chosen, and the figures are large enough to be clearly understood. Very definitely this is not one of those texts in which a fear of expense has kept the photographs down to a size that tempted the student to use the microscope on the textbook as well as his histological slides.

KNOWING YOUR TREES, G. H. COLLINGWOOD, *The American Forestry Association, Washington, D. C., 1937. $1.00.*

Here is the biggest dollar's worth of forest information that has come our way in months. Into it has been packed a series of illustrations which by their very apt arrangement, make the study of trees a distinct, and easy pleasure. It is a large 8 by 10 inch book, of slightly more than a hundred pages. Each pair of facing pages offers the following: To the left a photograph of the full tree, and a healthy column of descriptive matter. On the right-hand pages are photographs of the leaves, fruit, flower and bark, together with more descriptive matter and a shaded map giving the range of the species. Fifty types are thus presented. This is, of course, only a small fraction of our American species, but since the typical forms from the various regions are presented it is quite sufficient to make a very handy and practical guide to the interested beginner.

THE LIFE STORY OF THE FISH, BRIAN CURTIS, *D. Appleton Century Co., New York, 1938. $3.00.*

Here is an unusual book. It is about fishes. It is scientific. Despite all of this the author has the saving grace of humor and intelligence. The result is a consummation devoutly to be wished for in scientific treatises, a book that is delightfully readable, intelligently put together, humorous at times, and always accurate. For the fisherman, or woman, for the public and private library, for the youngster you wish to interest in science, for your own good pleasure, this is a "peach" of a book.

THE LONGEVITY OF PLANTS, HANS MOLISCH, *The Botanical Review, New York Botanical Garden, New York, 1938.*

In 1928 the late and justly revered Dr. Molisch prepared an interesting paper on the senescence of plants as his contribution to Korschelt's "Longevity, Decay and Death." This important paper has now been translated into English by Edmund H. Fulling, one of the editors of "*The Botanical Review.*" Since there is no other work on this subject now extant in English, the importance of this contribution to botanical literature cannot be underestimated. Aside from this fact the book is in itself interesting reading. There are many unusual details and provocative problems suggested in it which should be a common part of our ordinary botanical information, but which, strangely enough, are only occasionally found in isolated references. No botanical library should be without this work.

MANUAL OF PTERIDOLOGY, Fr. Verdoorn and Others, *Martinus Nijhoff, The Hague, Netherlands, 1938. 24 Guilders.*

The galaxy of twenty or more international authorities who have contributed under the able leadership of Fr. Verdoorn to the making of this unique volume on the pteridophyptes makes this one of the outstanding botanical publications of the year. The articles are either in English or German, the illustrations are plentiful, and the printing leaves nothing to be desired. Particularly interesting are the "on the spot" illustrations of the life habits of the various forms. The book covers in turn the morphology, anatomy, cytology, genetics, tropisms, chemistry, ecology and paleontology of the psilophtes, the lycopods, the equisetums, and the ferns. No research or college library is complete without this compendious work.

METHODS OF TISSUE CULTURE, Raymond C. Parker, *Paul B. Hoeber, Inc., New York, 1938. $5.00.*

A stimulating preface by Alexis Carrel opens this new textbook on tissue culture. Equipped with an extensive bibliography of over seven hundred and fifty references, this work should become a valuable adjunct wherever tissue culture is attempted. The techniques described are those of The Rockefeller Institute, which by reason of their great contributions to our knowledge of the vegetative life of cells merit the respect and the study of the biological world. Several of the more commonly used Lindbergh apparatuses are described, one of them for the first time in literature. All in all, this should be a valuable contribution to our knowledge of laboratory techniques.

AN OUTLINE OF GENERAL BIOLOGY, Gordon Alexander, *Barnes & Noble, New York, 1936. $.75.*

This revised syllabus in general biology is one of a large and varied series covering the majority of college courses which an enterprising publishing house is offering to college students. For general review purposes it is admirable. It might well be used as a class text when supplemented with an extensive lecture program. Since there are only 182 well illustrated pages, the matter is very closely compacted. This is compensated by the profuse bibliography of standard textbooks attached to each chapter. The concluding chapters on the human relations of biology, divided over the economic, social historical and philosophical fields, are particularly happy.

AN OUTLINE OF GENERAL FORESTRY, Joseph S. Illick, *Barnes & Noble, New York, 1936. $.75.*

Of all the manuals of general forestry which have come over this reviewing desk in the past two years, this closely compacted syllabus, recently revised and enlarged, makes the most favorable impression. Either as a review manual, or as a syllabus about which to build a lecture course, it should be altogether effective. As a synthesis of the ideas in many texts it combines the good features of most. Each chapter has its own bibliography of such current textbooks cited. Since the book can also be procured in cloth covers (at $1.50) it should form a welcome addition to the reference library as well.

PLANT CHEMICULTURE, C. D. Dawson and M. V. Dorn, *Published by the Authors, Los Angeles, 1938. $1.00.*

With all the commercialized advertising which has been flooding the country on the new processes of growing plants in aquatic solutions, this booklet comes as a rather pleasant surprise. Here is no commercialized secrecy regarding techniques which, while well known to the plant physiologist, are still a mystery to the layman. The entire technique of growing plants in water cultures is completely and openly discussed, standard formulae are given, and minute directions for setting up the apparatus necessary are both outlined and illustrated. Botany and general biology teachers who wish to experiment in this new departure will do well to investigate this work.

PLANT HUNTER'S PARADISE, F. KINGDON WARD, *The Macmillan Co., New York, 1938. $3.50.*

The discovery and importation of the seeds, roots, bulbs and cuttings of rare or strange plants from foreign situations is going on so constantly that it is accepted by those who know as a matter of course. Those who do not "know" are beyond the pale of elementary horticultural civilization. The author of the present work is one of those favored sons of civilization who is able to make of foreign and rare plant collecting something more than a hobby and a little less than a profession. This book is the story of a year's experiences in Assam and Burma along the Chinese boundary. It will be of more than ordinary interest to plant collectors, although it is not such bad adventure at that.

THE PLANT WORLD, C. STUART GAGER, *The University Society, 468 Fourth Ave., New York, 1931. Cloth $1.00, paper $.65.*

This is another, and one of the older issues in the University Series, Highlights of Modern Knowledge. For pure botany, interestingly written by an acknowledged leader, it is still hard to equal.

THE SMALLEST LIVING THINGS, GARY N. CALKINS, *The University Society, 468 Fourth Ave., New York, 1935. Cloth $1.00, paper $.65.*

This is another of the University Society's Highlights of Modern Knowledge Series. It covers the filterable viruses, bacteria, spirochaetes, protoplasm and elementary plant-animal forms, the protophyta, protozoa, parasitism, and finally, organization, vitality and mortality. Those who know Dr. Calkins, or are acquainted with his various class or research books, will recognize his fine hand in this, a popular work. Like all the rest of the University series, it is equipped with an extensive separate pamphlet as an explanatory reading guide.

TEXTBOOK IN EDUCATIONAL BIOLOGY, H. CLAY SKINNER, *Thomas Smyth and Frank M. Wheat, American Book Co., Cincinnati, Ohio, 1937. $2.50.*

This is a new type of biology text for prospective teachers. It is not intended for those fortunate individuals who are going to make biology a life work. As such, it therefore is a distinctly vocational type of approach to biology. On the assumption that "all human behavior is a biological phenomenon and each and every teacher is concerned with human behavior, growth, learning, adjustment, and the nature and needs of children," this book was written for the teachers' colleges. No doubt it will serve its purpose adequately, and pave the way for further study of pedagogical methods. However, if teachers are going to be required to study and teach courses in conservation similar to those recently introduced by law in Wisconsin and other states, this book leaves considerable to be desired. There are some twenty-two problems proposed for study in six units. The largest unit is the sixth, devoted to evolution and genetics,—chiefly the former. While no doubt it is practical to tell students where they came from, it would be more socially desirable to prepare them for intelligent community life.

WHEN ALL THE EARTH WAS WHITE, MARY MERCY HAWLEY, *Christopher Publishing House, Boston, 1938. $1.50.*

This is an unusually interesting little 98 page book on the last glaciation. It is not intended as a scientific treatise, although it is based on reputable authorities. As an introduction to the subject of the glaciers and their action en masse it should prove a valuable contribution to our lay literature. So much that is really scientific on the subject of the great glaciations is entirely too formidable for the average reader. The gap in our popular scientific literature on this point is now closed.

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